



OSTEOSARCOMA

What is osteosarcoma?

Osteosarcoma is a malignant cancer of the bone. In dogs, it usually occurs in the large and giant breeds, such as Great Danes, St. Bernards, Dobermans and Rottweilers, but any breed can be affected. Osteosarcoma typically affects middle aged to older dogs, but young adult dogs are also susceptible. Osteosarcoma most commonly affects one of the bones of the limbs such as the shoulder, carpus or wrist, and stifle or knee. Occasionally, osteosarcoma can originate in the bones of the skull, ribs or spine. The cause of this tumor is unknown.

How is it diagnosed?

Your pet may experience persistent lameness of the affected leg and/or swelling in the region of the affected bone. X-rays of the bone will alert your veterinarian to the likelihood of osteosarcoma; however other diseases such as bacterial or fungal infections of the bone, bone injuries, and other types of tumors can mimic the appearance of osteosarcoma on the x-ray. Thus, a fine needle aspirate of the bone or a bone biopsy must be performed to definitively diagnose osteosarcoma. These are relatively quick and simple procedures used to obtain a sample of the tumor for laboratory analysis. Some dogs will experience increased discomfort of the leg for 2-3 days following the biopsy. Pain medications are often prescribed to help lessen the discomfort. In rare instances, fracture of the diseased bone may occur following the biopsy procedure.

Once osteosarcoma is diagnosed, x-rays of the lungs are recommended, as this tumor has a high potential for metastases (spread) to the lungs. Occasionally, an abdominal ultrasound to detect spread to abdominal organs and/or a technetium bone scan, to detect tumor spread to other bones, may also be recommended before therapy of osteosarcoma is considered. Routine bloodwork is always recommended to evaluate your pet's overall health and evaluate a specific enzyme (alkaline phosphatase) that may help in determining your pet's prognosis with treatment.

How is it treated?

Treatment of osteosarcoma usually involves both surgery, to remove the primary tumor affecting the bone, and systemic chemotherapy to help delay or prevent the onset of metastases.



Surgery

Amputation of the affected limb is the standard treatment for osteosarcoma. Even large and giant breed dogs can function well after an amputation and most owners are pleased with their dog's mobility and quality of life following surgery. For some dogs, where amputation is not an option, limb-sparing may be considered. Limb-sparing involves removal of the cancerous bone and replacement with a bone graft, which is fixed to the remaining normal bone with a bone plate. Limb-sparing is usually recommended for dogs with severe pre-existing orthopedic or neurological problems that would not be functional with an amputation. Limb-sparing is most successful in dogs with tumors located in the carpus or wrist, where the tumor has not invaded more than half of the bone and has not invaded into the surrounding tissues.

Chemotherapy

Because of the high potential for metastases, chemotherapy is recommended following amputation. Platinum chemotherapy compounds (cisplatin and carboplatin) are the standard agents used. Occasionally doxorubicin (adriamycin) chemotherapy may be given in combination with either cisplatin or carboplatin. These drugs are given intravenously every 3 weeks for a total of 4 to 6 treatments. Side effects are usually minimal. Please refer to the chemotherapy handouts for more detailed information.

Radiation Therapy

When amputation or limb-sparing is not an option for your pet, radiation therapy may be used either as a palliative or more definitive treatment option.

Palliative Radiation Therapy

Palliative radiation may be used to decrease pain and improve function of the affected leg. Radiation therapy is usually administered in 2 consecutive daily treatments. Radiation therapy offers pain relief for 60-70% of dogs. Pain relief and improved function may be seen immediately after the first treatment or it may take several treatments to see the effects. In those dogs experiencing a decreased pain response with radiation therapy, the effects may last anywhere between 1-6 months, with 3 months being average. Radiation therapy is usually administered in 2 consecutive daily treatments. Side effects are usually not observed. Please refer to the Radiation Therapy handout for more information.

Definitive Radiation Therapy

Daily radiation may be used as a more definitive treatment in certain cases. This type of radiation is usually performed Monday-Friday daily for 3-4 weeks in a row. This type of radiation usually results in longer survival times than palliative radiation with an average survival of approximately 8 months when combined with chemotherapy.



Bisphosphonates

Bisphosphonates are a class of drugs that help to slow or prevent bone lysis thereby strengthening bone. These drugs are commonly used in humans in diseases such as osteoporosis and bone metastasis. These drugs have been shown to provide pain relief from osteosarcoma in up to 50% of dogs. These drugs are usually used in combination with radiation therapy, but may occasionally be used alone.

What is the prognosis?

Osteosarcoma is not usually a curable cancer. However, amputation and chemotherapy can give your pet many months to years of good quality of life.

Because of the high potential for metastases, amputation alone is purely palliative. Amputation of the affected limb will eliminate pain and offer good quality of life for your pet; however the development of metastases occurs on average in 3-4 months. With the addition of chemotherapy, we can extend your pet's life for an average of 10-14 months. Approximately 20-25% of dogs will live 2 years.